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Communications

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Donna L. Bethea
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September 16, 1996

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FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF SECRETARY

Mr. William F. Caton
Acting Secretary
Federal Communications Commission
1919 M Street, NW, Room 222
Washington, DC 20554

RE: Amendment of the Commission's Rules to Provide for Unlicensed NII/SUPERNet Operations in the 5 GHz Frequency Range (ET Docket No. 96-102)

Dear Mr. Caton:

On Friday, September 13, 1996, Kathleen Abernathy, Michael Kozlowski and I, on behalf of AirTouch Communications, met with David Wye, Elizabeth Lyle, Nancy Booker, and Pamela Megna to discuss issues relating to this proceeding. Please associate the attached material with the above-referenced proceeding.

Two copies of this notice are being submitted to the Secretary of the FCC in accordance with Section 1.1206(a)(1) of the Commission's Rules.

Please stamp and return the provided copy to confirm your receipt. Please contact me at 202-293-4960 should you have any questions or require additional information concerning this matter.

Sincerely,

Donna Bethea

Donna L. Bethea

Attachment

cc: Nancy Booker
Elizabeth Lyle
Pamela Megna
David Wye

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AIRTOUCH COMMUNICATIONS, INC.

Amendment of the Commission's Rules to Provide for Unlicensed NII/SUPERNet Operations in the 5 GHz Frequency Range

(ET Docket No. 96-102)

Kathleen Q. Abernathy
Donna L. Bethea
Michael A. Kozlowski
September 13, 1996

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Globalstar Feederlinks

- 5091 - 5250 MHz Earth-to-space
- Eight 16.5 MHz channels on each of two polarizations
- Guardbands between channels to mitigate self-interference
- Single beam isoflux 5 GHz receive antenna per satellite
  - Compensates for curvature of the earth, slant range and atmospheric losses
  - Uniform gain w.r.t. earth's surface
  - Designed for feederlink station operation down to 10 degrees elevation
- Beam coverage diameter over 3000 nmi

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SUPERNet Device Interference Issues

■ Directional antennas yield little improvement

- ❑ Satellite isoflux antennas have high gain at 10 degrees
- ❑ High performance antennas needed to keep sidelobes below 10 degrees

■ Increasing feederlink station EIRP not a solution

- ❑ Increases amount of satellite power required
- ❑ Satellite S-Band service downlink pfd limited by the ITU
- ❑ Satellite noise floor much lower than mobile earth terminals

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SUPERNet Device Interference Issues

■ Duty cycle constraints a possible option

- ❑ Limit transmitter on time
- ❑ Implement listen-before-talk
- ❑ Prohibit continuous transmissions by specifying minimum transmitter off time after on
- ❑ Use an efficient air interface protocol

■ Power limit recommendations

- ❑ Tie maximum power to channel bandwidth: specify in spectral density
- ❑ Utilize lower spectral density limits for smaller channel bandwidths
- ❑ Restrict outdoor units to above 5250 MHz
- ❑ Specify device out-of-band emissions (on the order of -10 to -20 dBc)

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Sample Scenarios

Parameter	AirTouch Filing	Case 1	Case 2	Case 3
# Total Devices	50 Million	50 Million	50 Million	50 Million
Bandwith/Device	20 Mhz	**10 Mhz**	**10 Mhz**	**10 Mhz**
# Devices/Band	10 Million	5 Million	5 Million	**50 Million**
Duty Cycle	50%	**100%**	**100%**	**100%**
Outdoor Use	60%	**100%**	**100%**	**100%**
Gain Outdoors*	2 dB	**0 dB**	**0 dB**	**0 dB**
S/C Noise Temp.	549.5 K	549.5 K	549.5 K	**1000 K****
Self Interference	Yes	Yes	**No**	**No**
S/C Eb/No Impact	95.0%	95.1%	98.3%	99.7%
User Eb/No Impact	26.7%	27.5%	32.6%	82.8%

* Indoor gain is always -17 dB.

** Although 549.5 K was used in AirTouch's filing, using 1000 K instead does not appreciably contribute to User Impact

Bold indicates changes from AirTouch filing estimates.

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Part 15 Operation Rules

- Unlicensed Part 15 devices have no spectrum allocation status, but rather have a secondary status only:

  "Persons operating intentional or unintentional radiators shall not be deemed to have a vested or recognizable right to continue use of any given frequency..." (47 C.F.R. 15.5(a) (1995))

- These devices are prohibited from causing harmful interference to and must accept interference from licensed radio services:

  "Operation of an intentional, unintentional, or incidental radiator is subject to the conditions that no harmful interference is caused and that interference must be accepted that may be caused by the operation of an authorized radio station..." (47 C.F.R. 15.5(b))

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Summary

- Development of Globalstar system is near completion
  - Most design parameters have been finalized
  - Significant changes are not feasible
- Key parameters of SUPERNet devices must be effectively regulated to reduce interference into NGSO MSS feeder links
- "Safe Harbor" rule for Part 15 device operation does not ensure protection against harmful interference for licensed users.